

### Recent research trends of electrical, magnetic, optical and acoustic stimulations at acupoints; a literature review

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**Purpose:** In parallel with the growing popularity of the clinical practice of acupuncture, research on modern acupuncture-like stimulation devices (ASDs) has been increasing in recent decades. To summarize the research on the four most popular ASDs, which are based on electrical, magnetic, laser and ultrasonic stimulations, with a focus on their effectiveness in human beings.

**Methods:** We analyzed papers from several medical electronic databases, including Medline, PubMed, the Cochrane Library, and Web of Science. Studies with all types of design and clinical indications that were performed with human subjects and written in English were included. We excluded papers that contained clinical experiments on animals and manual acupuncture techniques, and we also excluded review papers.

**Results:** A total of 728 studies were found, and 195 studies met our inclusion criteria. The 195 studies were included the 4 types of stimulation methods: 133 studies with electric stimulation (ES), 44 studies with laser stimulation (LS), 16 studies with magnetic stimulation (MS), and 2 studies with ultrasonic stimulation (US). These 4 types of stimulation can be further classified into 13 categories according to their effects. Of these studies, 181 reported therapeutic benefits. A total of 114 studies (58%) used random clinical trials (RCTs), and 109 studies (96%) reported therapeutic benefits among the RCTs.

**Conclusion:** For the first time, we reviewed the therapeutic effects of the four most popular ASDs which are ES, LS, MS and US. We found that the ES technique was the earliest modern application and the most widely studied among ASDs, and was followed by LS, MS and US. The majority of the studies (32%) focused on the effects of analgesia and pain relief, and brain activity (16%) was an emerging research field. We expect noninvasive or minimally invasive ASDs will become more popular in the acupuncture research due to safety, infection, and convenience.

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### A Linked Data in Korean Medicine

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**Purpose:** Linked data is a method of publishing and sharing pieces of data, information, and knowledge on the Web using Semantic Web technologies such as URI, RDF, and HTTP. To share Korean medicine knowledge on the Web, first of all, information on Korean medicine is required to be linked with that on other domains. The aim of this study is to construct

knowledge can be published and shared on the Web.

**Methods:** Information on medicinal materials in Korean medicine is constructed using ontology. Each medicinal material has scientific names, category names, family names, using parts, meridian entries, natures, flavors, toxicities, effects, treatments, and contraindications. All entities are identified with URIs and linked each other using RDF. In particular, scientific names are linked to taxonomy IDs, provided in NCBI.

**Results:** An ontology for about 800 medicinal materials is constructed. This ontology is also registered in Datahub, where users can publish and share their datasets. In our ontology, 2,119 scientific names are linked to other datasets with biportal-ncbitaxon namespace. Our linked data can be queried using SPARQL and also downloaded as RDF/XML files in Datahub.

**Conclusion:** With the recent rising interest in Semantic Web, many people try to construct and publish information as linked data. To share Korean medicine knowledge with other domains on the Web, interlinking between each domain is required. In the future, we plan to link more information on our ontology to other datasets.

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### Applications on traditional Chinese prescription and medicine of the "spleen stomach damp-heat syndrome" based on modern literature research



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**Purpose:** Analyze the status and regular pattern on the usage of traditional Chinese prescription and medicine of the "spleen stomach damp-heat syndrome" in the modern literature.

**Methods:** Taking "spleen stomach damp-heat syndrome" as subject term or title/keyword, the databases of China National Knowledge Infrastructure(CNKI), Wanfang Data Knowledge Service Platform and VIP Information were systematically retrieved for collecting related literature before 2014, the related data was given descriptive and statistical analysis by using Excel software.

**Results:** 1. The results about application of traditional Chinese prescription of the "spleen stomach damp-heat syndrome": The classic ancient Chinese medicine prescriptions accounted for 49%, clinical experience prescription of famous old doctor of Traditional Chinese Medicine in the modern, the clinician's self prescription and hospital preparation accounted for 51%; The most commonly traditional Chinese prescriptions are "Pinellia Heart- Purging Decoction (Banxia Xiexin Tang)", "Three-Nut Decoction (Sanren Tang)", "Coptis and Clearing Gallbladder-Heat Decoction (Huanglian Wendan Tang)" and "Calming the Stomach Powder (Pingwei San)", and so on. 2. The usage of the frequency in the top 14 of traditional Chinese medicine are Huanglian (rhizoma coptidis),

Banxia (rhizoma pinelliae), Houpu (cortex magnoliae officinalis), Gancao (radix glycyrrhizae), Chenpi (pericarpium citri reticulatae), Huangqin (radix scutellariae), Fuling (poria), Pugongying (herba taraxaci), Huoxiang (herba pogostemonis), Cangzhu (rhizoma atractylodis), Yiyiren (semen coicis), Baidoukou (fructus amomi rotundus), Baizhu (rhizoma atractylodis macrocephalae) and Zhiqiao (fructus aurantii). 3. The “spleen stomach damp-heat syndrome” is most common in digestive system diseases, its ratio has reached 75%.

**Conclusion:** At this stage, the classic ancient Chinese medicine prescription is still the backbone in the treatment of the “spleen stomach damp-heat syndrome”, but clinical experience prescription of famous old doctor of Traditional Chinese Medicine in the modern and hospital preparation are showing a rising trend; The clinical disease of spleen stomach damp-heat syndrome is most common in digestive system diseases, but the other system diseases can also not be ignored. This work is supported by 973 pragramme (2011CB505105) and NNSF(No.81302915).

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### The Effect of Tai Chi for Patients with Type 2 Diabetes - Analysis According to the Styles of Tai Chi Considering the Intensity: Systematic Review



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**Purpose:** To compare and analyze the effects of various Tai Chi styles as an intervention on type 2 diabetes mellitus(T2DM) considering the intensity, on which different opinions have been given.

**Methods:** We searched articles from 12 databases in December 2014. We selected randomized controlled clinical trial (RCT) using Tai Chi on adult patients with T2DM. We performed quality assessment using Cochrane risk of bias (RoB) tool. And we conducted a meta-analysis according to the styles of Tai Chi.

**Results:** We found 13 RCTs within the inclusion criteria. 8 RCTs were studies about Yang style Tai Chi, 4 RCTs were about ‘Tai Chi for diabetes’ and 1 RCT was about Chen style Tai Chi. Studies about Yang and Chen styles of Tai Chi showed significant effect on T2DM, but studies about ‘Tai Chi for diabetes’ didn’t. The meta-analysis showed positive results of ‘Yang style Tai Chi’ for fasting blood glucose (FBG) compared to routine treatment, but failed to show the effects on Hemoglobin A1c (HbA1c). The meta-analysis of ‘Tai Chi for diabetes’ studies showed unfavorable effects on HbA1c compared to routine treatment. And the meta-analysis of 6 studies about all styles

of Tai Chi showed unfavorable effects on HbA1c compared to routine treatment.

**Conclusion:** It is thought that Tai Chi could be considered as an exercise treatment for patients with T2DM. Tai Chi of high intensity was more effective than that of low intensity in managing patients with T2DM. Therefore, we recommend that Tai Chi of high intensity be trained to T2DM patients with no special conditions and Tai Chi of low intensity be trained to T2DM patients with bad conditions. However, it is difficult to reach a firm conclusion because of low quality of included studies, so further studies are needed.

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### Construction of biological networks for Korean medical herb using the text-mining system



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**Purpose:** For decades, text-mining technology enhanced the accuracy so that biological researchers can search the useful biological information easily. In Traditional Korean Medicine (KTM), the requirement of knowledge based database about signal transduction pathway is growing to establish a new hypothesis of biological mechanism of KTM. To support the knowledge discovery, we construct the biological network database for major medical herbs in Korea.

**Methods:** The biological interaction information ranging from signal transduction pathway to chemical-protein interaction is extracted with text-mining system after downloading the literature data from Pubmed database. The extracted biological relation data is stored in graph database and visualized with biological network navigation system to represent the relations among genes, proteins and chemicals.

**Results:** Total 12,455 Pubmed abstracts are downloaded for 488 Korean medical herbs and analyzed with the text-mining tools based on Abner, Oscar4 as biological entity tagger and MKEM as biological interaction extractor. We collect 35,119 chemical information, 35,952 gene or protein information, and 29,479 interaction information. The biological interaction is stored in the graph database (Neo4j) to search and visualize it. Finally, we developed the web service to navigate the biological networks on web canvas.

**Conclusion:** In this research, we construct knowledge based biological database for visualizing the biological interaction and developed the web service for searching the biological interaction and navigating the results. Users can search the chemical relationship through signal transduction pathways on this web service.

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